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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/810,173
Filing Date: March 26, 2004
Appellant(s): CHIN ET AL.

Robert A. Blaha
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/24/2007 appealing from the Office action mailed 5/24/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2005/002032	Wijntjes et al.	1-2005
4,958,072	Hofler	9-1990

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-22 are under 35 U.S.C. 103(a) as being unpatentable over Wijntjes et al. (2005/0002032), (priority from provisional 60/468286 Filed May 5, 2003) in view of Hofler et al. (4958072).

In regard to claim 1, Wijntjes discloses (fig. 4, fig. 10A) a polaroid encoder system for detecting movement, the system having a movable polarizing code element (114); the polarizing code element having a first concentric code (754), a second concentric code (752), and a set of quadrants, the first and second concentric codes are adjacent one another over one of the four quadrants of the movable polarizing segment

(page 7, paragraph 00105); a detector module to detect an amplitude based on how much illumination passes through a first portion of the movable polarizing code element, the detector module having a illumination light detector (120A) covered with a first static polarizing filter (116A) that is oriented in a first direction; a second illumination detector (120B) covered with a second static polarizing filter (116B) that is oriented in a second direction (page 4, paragraphs 0067, 0068); a first determination module to identify a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; the first determination module responsive to a single illumination source that emits light that is directed at and unaltered before encountering the movable polarizing code element and thereafter unaltered before encountering a third illumination detector (fig. 16A, 802A); and a second determination module (fig. 16B, 804) coupled to receive the amplitude and the quadrant and to determine an angular position of the movable polarizing code element using the amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes fails to disclose the concentric codes being in contact with one another. However, Hofler discloses (fig. 2) a polarization encoder that uses two concentric codes (56, 60) that are in contact with one another over one of four quadrants (column 4, lines 40-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the polarizing code element of Wijntjes by placing the codes in contact with each other as taught by Hofler in order to reduce the minimum size of the code element, allowing for a more compact system.

In regard to claim 9, Wijntjes discloses (fig. 4, fig. 10A) a method for determining angular position of a movable polarizing code element, the method including illuminating the movable polarizing code element, the polarizing code element having a first concentric code (754), a second concentric code (752), and a set of quadrants, the first and second concentric codes are adjacent one another over one of the four quadrants of the movable polarizing segment (page 7, paragraph 00105); the illuminating including an illumination source such that emitted light is directed at and unaltered before encountering the movable polarizing code element and thereafter unaltered before encountering a third illumination detector (fig. 16A, 802A); detecting a first amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a first static polarizing filter (116A) oriented in a first direction; detecting a second amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a second static polarizing filter (116B) oriented in a second direction (page 4, paragraphs 0067, 0068); determining a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; and determining the angular position of the movable polarizing code element using the first amplitude, the second amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes discloses using photodetectors (120A, 120B; fig. 16A, 802A) to perform detection of the first and second amplitudes and determining the quadrant, but fails to disclose using photodiodes. However, Wijntjes teaches using a photodiode to perform measurement of the polarizing disc in another embodiment (page 3, paragraph 0046).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use photodiodes to detect the positioning of the disc in order to accurately, yet inexpensively, detect the light impinging on the detectors. Wijntjes fails to disclose the concentric codes being in contact with one another. However, Hofler discloses (fig. 2) a polarization encoder that uses two concentric codes (56, 60) that are in contact with one another over one of four quadrants (column 4, lines 40-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the polarizing code element of Wijntjes by placing the codes in contact with each other as taught by Hofler in order to reduce the minimum size of the code element, allowing for a more compact system.

In regard to claim 17, Wijntjes discloses (fig. 4, fig. 10A) a system for determining angular position of a movable polarizing code element, the system including means for illuminating the movable polarizing code element (110), the polarizing code element having a first concentric code (754), a second concentric code (752), and a set of quadrants, the first and second concentric codes are adjacent one another over one of the four quadrants of the movable polarizing element (page 7, paragraph 00105); means for illuminating including a single illumination source that emits light that is directed at and unaltered before encountering the movable polarizing code element and thereafter unaltered before encountering a third illumination detector (fig. 16A, 802A); means for detecting a first amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a first static polarizing filter (116A) oriented in a first direction (120A); means for detecting a second amplitude

based on how much illumination passes through a first portion of the movable polarizing code element and a second static polarizing filter (116B) oriented in a second direction (120B) (page 4, paragraphs 0067, 0068); means for identifying a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; and means for determining the angular position of the movable polarizing code element using the first amplitude, the second amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes fails to disclose the concentric codes being in contact with one another. However, Hofler discloses (fig. 2) a polarization encoder that uses two concentric codes (56, 60) that are in contact with one another over one of four quadrants (column 4, lines 40-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the polarizing code element of Wijntjes by placing the codes in contact with each other as taught by Hofler in order to reduce the minimum size of the code element, allowing for a more compact system.

In regard to claims 2, 3, 10, 15, 16, and 18, Wijntjes discloses (fig. 16B) a controller module (810) coupled to receive angular position of the movable polarizing element and the controller module uses the angular position to control a movable device coupled with the movable-polarizing code element; wherein the controller module is a motor controller (page 6, paragraph 0095 "motion control and measurement for various types of motors", page 7, paragraph 0111).

In regard to claims 5 and 22, Wijntjes discloses using photodetectors (120A, 120B; fig. 16A, 802A) to perform detection of the first and second amplitudes and determining the quadrant (with static polarizing filters covering detectors 120A and 120B), but fails to disclose using photodiodes. However, Wijntjes teaches using a photodiode to perform measurement of the polarizing disc in another embodiment (page 3, paragraph 0046). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use photodiodes to detect the positioning of the disc in order to accurately, yet inexpensively, detect the light impinging on the detectors.

In regard to claims 6, 11, 12, 19 and 20, Wijntjes in view of Hofler discloses a system and method as set forth above. Wijntjes fails to disclose the codes being opaque. However, Hofler further discloses (fig. 2) that the first and second concentric codes are substantially opaque (column 4, lines 40-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wijntjes by incorporating opaque codes in order to reduce manufacturing costs by printing the opaque code onto the code element. Wijntjes in view of Hofler discloses that the opaque code substantially obscures the illumination received by the illumination detector of the means for identifying the quadrant.

In regard to claim 7, Wijntjes discloses in Wijntjes (fig. 14) that the first and second concentric codes are located in a segment of the second portion of the movable polarizing code element.

In regard to claims 8 and 13, Wijntjes discloses in Wijntjes (fig. 16A) that the first determination module further has a second illumination detector (802B) located on the

same side of the movable polarizing code element as the first and second illumination detectors of the detector module (page 7, paragraph 0106-109).

In regard to claim 16, Wijntjes discloses detecting how much illumination passes through the second portion of the movable polarizing code element

In regard to claims 4, 14, and 21, Wijntjes discloses a polaroid encoder which uses two detectors each covered by a polarizing filter. Wijntjes also discloses a third detector with polarizing filter. The three filters are each 120 degrees out of phase, which is the maximum amount that three filters can be out of phase (page 2, paragraph 0018). Therefore, Wijntjes teaches placing filters out of phase with each other at the maximum amount, but fails to disclose the first two filters being 90 degrees out of phase. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the first two filters of a two filter system 90 degrees out of phase so that the two filters are the maximum amount out of phase, allowing the greatest possible precision.

(10) Response to Argument

Appellant first point of contention is that the proposed combination of Wijntjes and Hofler fails to disclose all of the claimed elements. Examiner would like to note that the basis for this argument is that neither Wijntjes nor Hofler disclose a "first determination module responsive to light that is directed at and unaltered before encountering the moveable polarizing code element and thereafter unaltered before encountering a third illumination detector." It is further noted that this element does not

necessitate the combination of Wijntjes and Hofler. Accordingly, Appellant's arguments regarding Hofler's failure to disclose the above limitation are irrelevant to the rejection at issue.

Examiner would also like to make clear that Examiner construes the above limitation to refer to the light source being unaltered before and after encountering the moveable polarizing code element and. But the light source is altered by the moveable polarizing code element itself.

In regard to independent claim 1, Appellant argues that Wijntjes fails to disclose a "first determination module responsive to light that is directed at and unaltered before encountering the moveable polarizing code element and thereafter unaltered before encountering a third illumination detector." Appellant's basis for this is the fact that Fig. 16A of Wijntjes discloses an electronic subsystem of Fig. 10A. Examiner completely agrees with this point. Putting Fig. 16A in proper context with Fig. 10A, elements 120A' and 120B' correlate to the similarly labeled detectors in Fig. 10A. These detectors are covered with polarizing filters (116A' and 116B'), which alter the light from the light source. However, Examiner does not state anywhere in the office action that these elements correspond to the first detection module. Rather, Examiner points to element 802A of Fig. 16A as the third illumination light detector which receives the unaltered light and to Paragraphs 0106-0112 which discloses that element 802A is part of a "first determination module" with element 802B and their respective circuitry. Element 802A is a separate 2-bit photodetector from elements 120A' and 120B' and operates in a

completely different way. *See* Paragraph 0108. Neither Fig. 10A nor Fig. 16A disclose a corresponding filter to alter the light traveling to element 802A.

Although, element 802A is not shown in fig. 10A, one cannot assume that there is a filter over 802A, especially because 802A serves a distinct purpose from elements 120A' and 120B'. Furthermore, interpreting the embodiment of Fig. 10A and Fig. 16A in light of the other embodiments, it is clear that Wijntjes contemplates a detector for detecting unaltered light. Figs. 4-7 and 9 all disclose a detector (120d) that detects unaltered light. For these reasons Examiner maintains the propriety of the rejection of claim 1.

In regard to independent claim 9, Examiner's position is the same as set forth with regard to claim 1.

In regard to independent claim 17, Examiner's position is the same as set forth with regard to claim 1.

Appellant next contends that the combination of Wijntjes and Hofler is improper because the references teach away from the claims. However, Appellant's basis for this is the same argument presented above. That is, because both references allegedly fail to disclose a determination module for detecting unaltered light, the references teach away. This argument is misplaced because the alleged missing limitation is not the

reason for the combination of the references. Accordingly, this argument should only be presented regarding the limitation necessitating the combination, which it is not.

Finally, Appellant does focus on the actual combination of Wijntjes and Hofler, stating that the Examiner failed to address the skill level of a person of ordinary skill in the art. Appellant states, "[a]ccording to KSR, the Examiner should not only identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does, the Examiner should include a detailed explanation of the effects of demands known to the design community or known in the marketplace and the 'background knowledge possessed by a person having ordinary skill in the art.'" Appeal Brief, page 18 (quoting *KSR Int'l Co. v. Teleflex*, Inc., 550 U.S. ___ (2007)). Appellant misreads *KSR* as requiring the Examiner to elaborate "a detailed explanation of the effects of demands known to the design community." Contrary to Appellant's position, the Supreme Court in *KSR* does not use this language to require a separate analysis of the Examiner. Rather, the Court uses this language to expand the obviousness analysis beyond the teaching, suggestion, or motivation test used by the Federal Circuit. *See KSR Int'l Co. v. Teleflex*, Inc., 550 U.S. ___ (2007)). In other words, if sufficient motivation is set forth in an obviousness analysis, it might not be necessary to make such detailed findings.

First of all, Examiner provided a clear motivation for replacing the code wheel of Wijntjes with the code wheel of Hofler. The code wheel of Wijntjes is exactly the same as that of Appellants and Hofler, except that the concentric codes are not in contact with

one another. Hofler taught the same code pattern having the two concentric codes in contact. Examiner provided sufficient motivation that one of ordinary skill in the art at the time the invention was made would have found placing the concentric codes in contact an obvious variation in order to eliminate space on the code wheel allowing for a more compact system. Accordingly, Examiner provided all of the steps required in a section 103 analysis. Because Examiner provided explicit motivation, there is not a need for Examiner to detail the level of ordinary skill in the art.

Furthermore, the combination of Wijntjes in view of Hofler can be characterized as no more "than the simple substitution of one known element for another" to produce a "predictable result" which the Supreme Court refuses to recognize as non-obvious. *See id.* Appellant's disclosure does not provide any reason why concentric codes in contact in a prior art system produces an unpredictable result.

For sake of Appellant's argument, Examiner assumes that one of ordinary skill in the art is someone with a masters degree in the field of optoelectronics who would appreciate that concentric codes being in contact versus spaced apart is an obvious variation.

For the above reasons, Examiner believes that the final rejection of the above claims is proper.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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